REMARKS

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendments, claims 1, 3-11 and 13-22 are pending in the application, with claims 1 and 11 being the independent claims. Claims 2 and 12 have been canceled without prejudice or disclaimer. Support for the subject matter of the amended claims is contained in the application as originally filed. Because the foregoing changes introduce no new matter, their entry is respectfully requested.

Claim Objections

Applicant respectfully requests the Examiner to withdraw his objection to claims 21 and 22. Both claims were previously amended to remove their multiple dependencies. *See* First Preliminary Amendment, submitted December 20, 2001.

As for the Examiner's remaining objections to claims 1-22, Applicant respectfully submits that the objections are overcome by the accompanying amendment thereto.

Rejections under 35 U.S.C. § 112

The Examiner has rejected claims 1-22 under 35 U.S.C. §112, second paragraph as being indefinite. Applicant respectfully submits that the rejection of claims 1-22 are overcome by the accompanying amendment thereto.

Rejections under 35 U.S.C. § 102 and 103

Claims 1 and 11

The Examiner has rejected claims 1 and 11 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,842,002 to Schnurer et al. ("the Schnurer patent"). The Schnurer patent fails to teach or suggest the method of the present invention including, inter alia, the steps of

"analyzing and learning from the viruses by analyzing the generated standard samples and extracting information and knowledge on the viruses

> indicated by changes between the standard samples before infection and after
> infection when it is determined that said target object to be scanned contains a
> virus; and
>
>   cleaning viruses from the infected target object by removing the virus's
> body and modifying key information which has been changed by said virus on the
> basis of said information and knowledge on the viruses indicated by changes
> between the standard samples before infection and after infection and on the basis
> of the modification that viruses have made to said infected objects or baits"

as is called for by amended claim 1. Similarly, the Schnurer patent fails to teach or suggest the computer system of the present invention which includes means and a unit for performing the above-mentioned steps.

The Schnurer patent instead discloses a computer virus trap for detecting computer viruses by providing a virtual computer environment to induce any disruptive behavior. The response/alarm means 52, which only makes a response or alarm can not do anything to clean the virus and recover the uninfected object. *See* column 8, lines 27-35, 50-59, FIG. 1.

In contrast, the solution of the present invention is to obtain information and knowledge on the viruses because the standard samples before the infection and the standard samples after the infection both are known after the step of activating the target object, and the difference or changes between the standard samples before and after the infection are known. From this difference, it is assumed that the difference between the infected target object and the virus-free target object is of the same type as the difference between the standard samples before and after the infection. Therefore, on the basis of the obtained difference between the infected samples and the non-infected samples, the invention cleans the viruses by removing the virus' body and modifying key information changed by the virus. In the present invention, it is not necessary to obtain the signature or characteristic codes of the viruses manually, so the virus cleaning step can be implemented by the machine automatically.

For at least these reasons, Applicant respectfully submits that the Schnurer patent does not anticipate independent claims 1 and 11. Applicant submits that claims 3-10 and 13-22, which depend from either claim 1 or 11, are allowable over the cited art for at least the same reasons noted above.

Claims 2, 8, 12 and 18

The Examiner has rejected claims 2, 8, 12 and 18 under 35 U.S.C. 103 as being unpatentable over the Schnurer patent in view of U.S. Patent No. 6,338,141 to Wells ("the Wells patent") and U.S. Patent No. 6,067,410 to Nachenberg ("the Nachenberg patent"). The rejections of claims 2 and 12 are rendered moot by the cancellation thereof, however, Applications hereby address the Examiner's rejection as similar limitations have been incorporated into claims 1 and 11. The Schnurer, Wells and Nachenberg patents, taken individually or combined, fail to teach or suggest the method of the present invention. As noted above, the Schnurer fails to disclose, inter alia, the steps of

> "analyzing and learning from the viruses by analyzing the generated standard samples and extracting information and knowledge on the viruses indicated by changes between the standard samples before infection and after infection when it is determined that said target object to be scanned contains a virus; and
> cleaning viruses from the infected target object by removing the virus's body and modifying key information which has been changed by said virus on the basis of said information and knowledge on the viruses indicated by changes between the standard samples before infection and after infection and on the basis of the modification that viruses have made to said infected objects or baits"

as is called for by amended claim 1. Similarly, the Schnurer patent fails to teach or suggest the computer system of the present invention which includes means and a unit for performing the above-mentioned steps. The Wells and Nachenberg patents fail to make up for the deficiencies of the Schnurer patent.

The Wells patent fails to disclose or suggest a system to detect and clean unknown viruses if no signature of the virus is already included in the known virus signature database. The Wells patent instead discloses a method for detecting and removing known viruses or variants of known viruses by using the combination and relationship of multiple signatures, signature types etc. Wells is but a traditional method for detecting and cleaning viruses by means of virus signature, although multiple signatures are used. In fact, the Wells patent teaches away from the present invention because the samples described at column 9, line 57, to column10, line 1, are not an equivalent of the "standard samples" set forth in claims 1 and 11 of

the present invention, but are actual files to be scanned. *See* column 9, lines 3-67 and column 10, lines 1-13.

The Nachenberg patent likewise fails to disclose or suggest a system to remove unknown viruses, only known viruses. The Nachenberg patent instead provides a method to deal with polymorphic viruses, which are encrypted, by emulating a virtual CPU and a memory to let the polymorphic virus decrypted. After the decryption, the overlay modules 262 with overlay repair routines 264 can repair the viruses. In fact, the Nachenberg patent teaches away from the present invention because each overlay module 262 or overlay routine 264 is for a specific virus. It means each overlay module 262 or overlay routine 264 can repair a certain known virus, not an unknown one. *See* column 3 lines 42-58, FIG. 2.

In contrast, the solution of the present invention is not only detecting the existence of unknown viruses, but also cleaning and removing the unknown viruses. Although Schnurer can detect unknown viruses, as Wells and Nachenberg use conventional method to remove viruses by means of known virus signatures, it is non-obvious for a person skilled person to obtain the solution of claims 1 and 11 by combining Schnurer with Wells and Nachenberg.

Although Schnurer teaches detecting viruses in a virtual computer environment, it is not able to remove viruses, especially the unknown viruses. Wells uses virus signatures to detect known viruses, and is incapable to detect and remove unknown viruses. By combining Wells with Schnurer, it is impossible to remove unknown viruses because Wells can handle known viruses only. The step 10b of analysis of Wells is "the mode that is used to produce virus signatures" which collects information on the virus to be sent to a vendor's virus analysis. In fact, the method in Wells is still a conventional technology to detect the known viruses with signatures, and in case of unknown viruses, the signature and information on the virus is collected for further use. Although Schnurer teaches detecting viruses by providing a virtual computer environment, as Wells still uses multiple virus signatures to detect the known viruses, and the Raven software in Wells is running on the actual files (not virtual files). Wells fails to provide an effective means to detect and remove viruses of which the signatures are unknown, thus there is no suggestion for Wells to be combined with Schnurer. Even by combining Wells

PATENT

with Schnurer, it is difficult for a person skilled in the art to obtain the solution of the present amended claims 1 and 11 which provides a virtual computer environment and various standard samples in the virtual computer environment to induce the infection from a possible infected target object. In case the samples are infected, a virus is detected; and by comparing the standard samples before and after infection, and on the basis of the same, the virus is removed or cleaned from the infected target object (actual file) by making changes reverse to those between the standard samples before and after infection. In this way, any kind of viruses, known or unknown, can be detected, and in most cases, viruses including unknown viruses can be cleaned or removed from an infected target object, without jeopardizing the actual computer system or files. Therefore, the amended claims 1 and 11 are non-obvious over Schnurer in light of Wells.

Furthermore, Nachenberg is designed to deal with polymorphic viruses and it uses fixed overlay modules 262 each designed specifically to remove a certain virus, so it is not able to remove unknown viruses. Even combining Nachenberg with Schnurer and/or Wells, it is not obvious to obtain the solution of the amended claims 1 and 11.

For at least these reasons, Applicant respectfully submits that the Wells patent and the Nachenberg patent, taken individually or combined, do not anticipate or render obvious independent claims 1 and 11. Applicant submits that claims 3-10 and 13-22, which depend from either claim 1 or 11, are allowable over the cited art for at least the same reasons noted above.

Claims 3, 4-7, 9-10, 13-17, and 19-20

The Examiner has rejected claims 3, 4-7, 9-10, 14-17, and 19-20 under 35 U.S.C. 103 as being anticipated by the Schnurer patent in view of the Wells and Nachenberg patent, and further in view of one or more of: the Connectix Virtual PC software by Connectix ("the Connectix software"), U.S. Patent No. 5,832,208 to Chen ("the Chen patent") and "Thomas' NT Utility Disk" by Thomas Berger ("the Berger publication"). As noted above, the Schnurer patent, the Wells patent, and the Nachenberg patent, taken individually or combined, fail to teach or suggest the method and computer system of the present invention. The Connectix software, the Chen patent and the Berger publication fail to account for the deficiencies of the Schnurer, Wells and

Nachenberg patents. In fact, the Examiner does not rely on any of these references to teach or suggest the steps of

> "analyzing and learning from the viruses by analyzing the generated standard samples and extracting information and knowledge on the viruses indicated by changes between the standard samples before infection and after infection when it is determined that said target object to be scanned contains a virus; and
>   cleaning viruses from the infected target object by removing the virus's body and modifying key information which has been changed by said virus on the basis of said information and knowledge on the viruses indicated by changes between the standard samples before infection and after infection and on the basis of the modification that viruses have made to said infected objects or baits"

For at least these reasons, Applicant respectfully submits that the Wells patent and the Nachenberg patent, taken individually or combined, in view of the Connectix software, the Chen patent and the Berger publication, do not render obvious independent claims 1 and 11. Applicant submits that claims 3, 4-7, 9-10, 13-17, and 19-20, which depend from either claim 1 or 11, are allowable over the cited art for at least the same reasons noted above.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided below.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extension of time or additional claims, and/or credit any overpayment to Deposit Account No. 50-2319 (Order No. 469164-00005; Docket No. A-70915/DJB/VEJ).
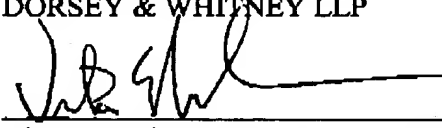
Prompt and favorable consideration of this Amendment and Response is respectfully requested.

Respectfully submitted,

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Date: 7/29/2005

By: _____

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